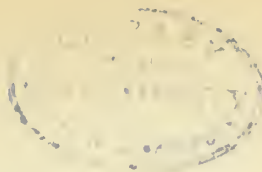


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# Maine Agricultural Experiment Station

BULLETIN No. 114.

MARCH, 1905.

## FERTILIZER INSPECTION.

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This Bulletin contains the analyses of Manufacturers' samples of brands of Fertilizers licensed before March 1, 1905. Dealers are cautioned to consult with the Station before offering brands not given in this Bulletin.

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Requests for bulletins should be addressed to the  
AGRICULTURAL EXPERIMENT STATION,  
Orono, Maine.

# MAINE

## AGRICULTURAL EXPERIMENT STATION,

### ORONO, MAINE.

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## FERTILIZER INSPECTION.

CHAS. D. WOODS, Director.

J. M. BARTLETT, Chemist in Charge of Fertilizer Analysis.

The law regulating the sale of commercial fertilizers in this State calls for two bulletins each year. The first of these contains the analyses of the samples received from the manufacturer, guaranteed to represent, within reasonable limits, the goods to be placed upon the market later. The second bulletin contains the analyses of the samples collected in the open market by a representative of the Station.

In the tables which follow the discussion there are given the results of the analyses of the manufacturers' samples of licensed brands. The tables include all the brands which have been licensed to March 1, 1905. Dealers are cautioned against handling any brands not given in this list without first writing the Station.

The figures which are given as the percentages of valuable ingredients guaranteed by the manufacturers are the minimum percentages of the guarantee. If, for instance, the guarantee is 2 to 3 per cent of nitrogen, it is evident that the dealer cannot be held to have agreed to furnish more than 2 per cent, and so this percentage is taken as actual guarantee. The figures under the head of "found" are those showing the actual composition of the samples.

To produce profitable crops and at the same time to maintain and even to increase the productive capacity of the soil may rightly be termed "good farming." Many farmers are able to do this, and the knowledge of how to do it has been largely acquired through years of experience, during which the character of the soil, its adaptability for crops, and the methods of its management and manuring have been made the subjects of careful study, without, however, any definite and accurate knowledge concerning manures and their functions in relation to soils and crops. To those who desire to study this question,

the Station will, on application, send a list of suitable books. Experience in the field, explained by experiments in the laboratory, has clearly demonstrated a few principles which underlie the successful and economical use of fertilizers.

Soils vary greatly in their capabilities of supplying food to crops. Different ingredients are deficient in different soils. The way to learn what materials are proper in a given case is by observation and experiment. The rational method for determining what ingredients of plant-food a soil fails to furnish in abundance, and how these lacking materials can be most economically supplied, is to put the questions to the soil with different fertilizing materials and get the reply in the crops produced. How to make these experiments is explained in Circular No. 8 of the Office of Experiment Stations of the U. S. Department of Agriculture. A copy of this circular can be had by applying to the Secretary of Agriculture, Washington, D. C., or to the Maine Agricultural Experiment Station.

The chief use of fertilizers is to supply plant-food. It is good farming to make the most of the natural resources of the soil and of the manures produced on the farm, and to depend upon artificial fertilizers only to furnish what more is needed. It is not good economy to pay high prices for materials which the soil may itself yield, but it is good economy to supply the lacking ones in the cheapest way. The rule in the purchase of costly commercial fertilizers should be to select those that supply, in the best forms and at the lowest cost, the plant-food which the crop needs and the soil fails to furnish.

Plants differ widely with respect to their capacities for gathering their food from soil and air; hence the proper fertilizer in a given case depends upon the crop as well as upon the soil. The fertility of the soil would remain practically unchanged if all the ingredients removed in the various farm products were restored to the land. This may be accomplished by feeding the crops grown on the farm to animals, carefully saving the manure and returning it to the soil. If it is practicable to pursue a system of stock feeding in which those products of the farm which are comparatively poor in fertilizing constituents are exchanged in the market for feeding stuffs of high fertilizing value, the loss of soil fertility may be reduced to a minimum, or there may be an actual gain in fertility.

## CONSTITUENTS OF FERTILIZERS.\*

The only ingredients of plant-food which we ordinarily need to consider in fertilizers are potash, lime, sulphuric acid, phosphoric acid, and nitrogen. The available supply of sulphuric acid and lime is often insufficient; hence one reason for the good effect so often observed from the application of lime, and of plaster, which is a compound of lime and sulphuric acid. The remaining substances, nitrogen, phosphoric acid and potash, are the most important ingredients of our common commercial fertilizers, both because of their scarcity in the soil and their high cost. It is in supplying these that phosphates, bone manures, potash salts, guano, nitrate of soda, and most other commercial fertilizers are chiefly useful.

The term "form" as applied to a fertilizing constituent has reference to its combination or association with other constituents which may be useful, though not necessarily so. The form of the constituent, too, has an important bearing upon its availability, and hence upon its usefulness as plant food. Many materials containing the essential elements are practically worthless as sources of plant food because the form is not right; the plants are unable to extract them from their combinations; they are "unavailable." In many of these materials the forms may be changed by proper treatment, in which case they become valuable not because the element itself is changed, but because it then exists in such form as readily to feed the plant.

*Nitrogen* is the most expensive of the three essential fertilizing elements. It exists in three different forms, organic nitrogen, ammonia and nitrate.

*Organic nitrogen* exists in combination with other elements either as vegetable or animal matter. All materials containing organic nitrogen are valuable in proportion to their rapidity of decay, because change of form must take place before the nitrogen can serve as food. Organic nitrogen differs in availability not only according to the kind of material which supplies it, but according to the treatment it receives. The nitrogen in the tables of analyses marked "insoluble in water" is organic nitrogen.

\* Farmers Bulletin 44 of the U. S. Dept. of Agriculture, "Commercial Fertilizers, Composition and Use," can be had free by applying to your Congressman.



*Nitrogen as ammonia* usually exists in commercial manures in the form of sulphate of ammonia and is more readily available than organic nitrogen. While nitrogen in the form of ammonia is extremely soluble in water, it is not readily removed from the soil by leaching, as it is held by the organic compounds of the soil.

*Nitrogen as nitrate* exists in commercial products chiefly as nitrate of soda. Nitrogen in this form is directly and immediately available, no further changes being necessary. It is completely soluble in water, and diffuses readily throughout the soil. It differs from the ammonia compounds in forming no insoluble compounds with soil constituents and may be lost by leaching. The "Nitrogen soluble in water" of the tables includes both the nitrogen as ammonia and as nitrate.

*Phosphoric acid* is derived from materials called phosphates, in which it may exist in combination with lime, iron, or alumina as phosphates of lime, iron or alumina. Phosphate of lime is the form most largely used as a source of phosphoric acid. Phosphoric acid occurs in fertilizers in three forms: That soluble in water and readily taken up by plants; that insoluble in water, but still readily used by plants, also known as "reverted;" and that soluble only in strong acids and consequently very slowly used by the plant. The "soluble" and "reverted" together constitute the "available" phosphoric acid. The phosphoric acid in natural or untreated phosphates is insoluble in water, and not readily available to plants. If it is combined with organic substance, as in animal bone, the rate of decay is more rapid than if with purely mineral substances. The insoluble phosphates may be converted into soluble forms by treatment with strong acids. Such products are known as acid phosphates or superphosphates. The "insoluble phosphoric acid" of a high cost commercial fertilizer has little or no value to the purchaser because at the usual rate of application the quantity is too small to make any perceptible effect upon the crop, and because its presence in the fertilizer excludes an equal amount of more needful and valuable constituents.

*Potash* in commercial fertilizers exists chiefly as muriates and sulphates. With potash the form does not exert so great an influence upon availability as is the case with nitrogen and phosphoric acid. All forms are freely soluble in water, and are



believed to be nearly if not quite equally available as food. The form of the potash has an important influence upon the quality of certain crops. For example, the results of experiments seem to indicate that the quality of tobacco, potatoes, and certain other crops is unfavorably influenced by the use of muriate of potash, while the same crops show a superior quality if materials free from chlorides have been used as the source of potash.

#### VALUATION OF FERTILIZERS.

The agricultural value of any fertilizing constituent is measured by the value of the increase of the crop produced by its use, and is, of course, a variable factor, depending upon the availability of the constituent, and the value of the crop produced. The form of the materials used must be carefully considered in the use of manures. Slow-acting materials cannot be expected to give profitable returns upon quick growing crops, nor expensive materials profitable returns when used for crops of relatively low value.

The agricultural value is distinct from what is termed "commercial value," or cost in market. This value is determined by market and trade conditions, as cost of production of the crude material, methods of manipulation required, etc. Since there is no strict relation between agricultural and commercial or market value, it may happen that an element in its most available form, and under ordinary conditions of high agricultural value, costs less in market than the same element in less available forms and of a lower agricultural value. The commercial value has reference to the material as an article of commerce, hence commercial ratings of various fertilizers have reference to their relative cost and are used largely as a means by which the different materials may be compared.

The commercial valuation of a fertilizer consists in calculating the retail trade-value or cash-cost at freight centers (in raw material of good quality) of an amount of nitrogen, phosphoric acid and potash equal to that contained in one ton of the fertilizer. Plaster, lime, stable manure and nearly all of the less expensive fertilizers have variable prices, which bear no close relation to their chemical composition, but guanos, superphosphates, and similar articles, for which \$20 to \$45 per ton are paid, depend for their trade value exclusively on the sub-

stances, nitrogen, phosphoric acid and potash, which are comparatively costly and steady in price. The trade-value per pound of these ingredients is reckoned from the current market prices of the standard articles which furnish them to commerce. The consumer, in estimating the reasonable price to pay for high-grade fertilizers, should add to the trade-value of the above-named ingredients a suitable margin for the expenses of manufacture, etc., and for the convenience or other advantage incidental to their use.

For many years this Station has not printed an estimate of the commercial value of the different brands licensed in the State. If anyone wishes to calculate the commercial value he can do so by using the trade values adopted for 1904 by the Experiment Stations of Connecticut, Massachusetts, Rhode Island and New Jersey. These valuations represent the average retail prices at which these ingredients could be purchased during the three months preceding March 1, 1904, in ton lots at tide water in the states named. On account of the greater distance from the large markets the prices for Maine at tide water would probably be somewhat higher than those quoted.

## TRADE VALUES OF FERTILIZING INGREDIENTS FOR 1904.

	Cents per pound.
Nitrogen in nitrates.....	16
in ammonia salts.....	17½
Organic nitrogen in dry and fine ground fish, meat and blood, and in mixed fertilizers...	17½
in fine bone and tankage.....	17
in coarse bone and tankage.....	12½
Phosphoric acid, water-soluble.....	4½
citrate-soluble .....	4
of fine ground bone and tankage....	4
of coarse bone and tankage.....	3
of cotton seed meal, castor pomace, and ashes .....	4
of mixed fertilizers, if insoluble in ammonium citrate .....	2
Potash as high grade sulphate and in forms free from muriate (or chlorides) .....	5
as muriate .....	4½

The commercial valuation will be accurate enough as a means of comparison if the following rule is adopted:

Multiply 3.5 by the percentage of nitrogen.

Multiply 0.8 by the percentage of available phosphoric acid.

Multiply 0.4 by the percentage of insoluble phosphoric acid.

Multiply 1.0 by the percentage of potash.

The sum of these four products will be the commercial valuation per ton on the basis taken.

Illustration. The table of analyses shows a certain fertilizer to have the following composition: Nitrogen 2.00 per cent; Available phosphoric acid 8.50 per cent; Insoluble phosphoric acid 3.50 per cent; Potash 3.25 per cent. The valuation in this case will be computed thus:

Nitrogen,	$3.5 \times 2.00,$	7.00
Available phosphoric acid,	$.8 \times 8.50,$	6.80
Insoluble phosphoric acid,	$0.4 \times 3.50,$	1.40
Potash,	$1.0 \times 3.25,$	3.25
Valuation per ton,		<u>\$18.45</u>

Since this rule assumes all the nitrogen to be organic and all the potash to be in the form of the sulphate, it is evident that the valuations thus calculated must not be taken as the only guide in the choice of a fertilizer. At best the valuations can only serve to show the approximate cost of the several ingredients contained in the fertilizer in question. In every case the farmer should consider the needs of his soil before he begins to consider the cost. In many instances a little careful experimenting will show him that materials containing either nitrogen, potash, or phosphoric acid alone will serve his purpose as fully as a "complete fertilizer," in which he must pay for all three constituents, whether needed or not.

The results of the analyses of the manufacturers' samples of fertilizers are given on the following pages.

*Descriptive List of Manufacturers' Samples, 1905.*

Station number.	Manufacturer, place of business and brand.
	<b>THE AMERICAN AGRICULTURAL CHEMICAL CO., NEW YORK, N. Y.</b>
20004	Bradley's Alkaline Bone with Potash .....
20005	Bradley's Complete Manure for Potatoes and Vegetables.....
20006	Bradley's Complete Manure with 10% Potash.....
20007	Bradley's Corn Phosphate .....
20008	Bradley's Eureka Fertilizer .....
20009	Bradley's Niagara Phosphate .....
20010	Bradley's Potato Fertilizer .....
20011	Bradley's Potato Manure .....
20012	Bradley's X. L. Superphosphate of Lime.....
20013	Clark's Cove Bay State Fertilizer .....
20014	Clark's Cove Bay State Fertilizer, G. G.....
20015	Clark's Cove Bay State Fertilizer for Seeding Down.....
20016	Clark's Cove Defiance Complete Manure.....
20017	Clark's Cove Great Planet Manure, A. A .....
20018	Clark's Cove King Philip Alkaline Guano.....
20019	Clark's Cove Potato Fertilizer.....
20020	Clark's Cove Potato Manure.....
20021	Cleveland Fertilizer for All Crops.....
20022	Cleveland High Grade Complete Manure .....
20023	Cleveland Potato Phosphate .....
20024	Cleveland Seeding Down Fertilizer.....
20025	Cleveland Superphosphate .....
20026	Complete Manure with 10% Potash .....
20027	Crocker's Aroostook Potato Special.....
20028	Crocker's Corn Phosphate .....
20029	Crocker's Grass and Oats Fertilizer .....
20030	Crocker's New Rival Ammoniated Superphosphate .....
20031	Crocker's Potato, Hop and Tobacco.....
20032	Crocker's Special Potato Manure .....
20033	Cumberland Guano for All Crops .....
20034	Cumberland Potato Fertilizer.....
20035	Cumberland Seeding Down Manure .....
20036	Cumberland Superphosphate.....
20037	Darling's Blood, Bone and Potash .....
20038	Fine Ground Bone .....
20039	Grass and Lawn Top Dressing .....
20040	Great Eastern General Fertilizer .....
20041	Great Eastern Grass and Oats Fertilizer .....
20042	Great Eastern High Grade Potato Manure .....
20043	Great Eastern Northern Corn Special.....
20044	Great Eastern Potato Manure.....
20045	High Grade Fertilizer with 10% Potash.....
20046	High Grade Sulphate of Potash .....
20047	Lazaretto Aroostook Potato Guano.....
20048	Lazaretto Corn Guano.....

*Analyses of Manufacturers' Samples, 1905.*

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
	%	%	%	%	%	%	%	%	%	%	%	%	%	
20004	.....	.....	.....	.....	6.27	4.51	2.60	10.78	11.00	13.38	12.00	2.01	2.00	
20005	1.06	2.40	3.46	3.30	5.36	3.32	1.51	8.68	8.00	10.19	9.00	6.91	7.00	
20006	1.99	1.31	3.30	3.30	3.59	3.19	2.44	6.78	6.00	9.22	7.00	11.20	10.00	
20007	0.66	1.42	2.08	2.06	7.05	2.55	2.56	9.60	8.00	12.16	10.00	2.01	1.50	
20008	0.11	1.06	1.17	1.03	5.93	2.35	1.55	8.28	8.00	9.83	10.00	2.32	2.00	
20009	0.40	0.64	1.04	0.82	5.41	3.15	1.38	8.56	7.00	9.94	8.00	1.49	1.00	
20010	0.77	1.22	1.99	2.06	5.74	4.74	2.54	10.48	8.00	13.02	10.00	3.17	3.00	
20011	0.81	1.58	2.39	2.50	2.89	3.80	3.18	6.69	6.00	9.87	8.00	5.15	5.00	
20012	1.10	1.36	2.46	2.50	6.74	3.16	1.80	9.90	9.00	11.70	11.00	2.68	2.00	
20013	1.14	1.32	2.46	2.50	7.26	3.08	1.80	10.34	9.00	12.14	11.00	2.35	2.00	
20014	0.62	1.40	2.02	2.06	7.21	2.42	2.36	2.63	8.00	11.99	10.00	1.95	1.50	
20015	0.41	0.74	1.45	1.03	5.93	2.80	2.42	8.73	8.00	11.15	10.00	2.57	2.00	
20016	0.40	0.68	1.08	0.82	5.24	2.74	1.48	7.98	7.00	9.46	8.00	1.59	1.00	
20017	1.88	1.52	3.40	3.30	5.20	3.01	1.96	8.21	8.00	10.17	9.00	7.43	7.00	
20018	0.43	0.68	1.11	1.03	5.71	2.67	1.47	8.38	8.00	9.85	10.00	2.12	2.00	
20019	0.91	1.03	1.94	2.06	6.49	5.31	0.40	11.80	8.00	12.20	10.00	3.35	3.00	
20020	0.56	2.11	2.67	2.50	3.96	3.03	3.49	6.99	6.00	10.48	8.00	5.59	5.00	
20021	0.34	0.72	1.06	1.03	5.50	2.87	2.60	8.37	8.00	10.97	10.00	2.30	2.00	
20022	2.02	1.21	3.23	3.30	4.96	3.41	2.27	8.37	8.00	10.64	9.00	7.53	7.00	
20023	0.62	1.34	1.96	2.06	5.95	3.99	2.74	9.94	8.00	12.68	10.00	3.03	3.00	
20024	0.11	1.06	1.17	1.03	5.79	2.89	1.27	8.68	8.00	9.95	10.00	2.20	2.00	
20025	0.66	1.40	2.06	2.06	7.17	2.35	2.62	9.52	8.00	12.14	10.00	2.03	1.50	
20026	1.34	1.72	3.06	3.30	3.84	2.33	2.11	6.17	6.00	8.28	7.00	10.19	10.00	
20027	0.81	1.29	2.10	2.06	5.17	3.33	2.03	8.50	8.00	10.53	.....	6.61	6.00	
20028	0.26	2.06	2.32	2.06	4.52	3.65	3.87	8.17	8.00	12.04	.....	2.26	1.50	
20029	.....	.....	.....	.....	7.54	4.28	1.79	11.82	11.00	13.61	.....	2.03	2.00	
20030	0.23	1.14	1.37	1.03	4.82	3.70	2.47	8.52	8.00	10.99	.....	2.12	2.00	
20031	1.10	1.10	2.20	2.06	5.98	2.07	2.68	8.05	8.00	10.73	.....	3.34	3.00	
20032	2.01	1.30	3.31	3.29	3.84	3.29	2.34	7.13	6.00	9.47	.....	10.80	10.00	
20033	0.03	1.23	1.26	1.03	6.22	3.00	2.49	9.22	8.00	11.71	10.00	2.28	2.00	
20034	0.72	1.34	2.06	2.06	6.13	4.17	2.33	10.30	8.00	12.63	10.00	3.38	3.00	
20035	0.44	0.72	1.16	1.03	5.42	2.98	2.53	8.40	8.00	10.93	10.00	2.53	2.00	
20036	0.56	1.38	1.94	2.06	7.01	2.38	2.55	9.39	8.00	11.94	10.00	2.35	1.50	
20037	2.26	1.64	3.90	4.10	2.81	4.44	2.40	7.25	7.00	9.65	8.00	7.41	7.00	
20038	.....	.....	.....	2.50	.....	.....	.....	.....	.....	21.00	.....	.....	.....	
20039	4.44	0.08	4.52	3.91	1.03	5.16	.97	7.69	5.00	8.66	6.00	3.56	2.00	
20040	*	*	1.10	0.82	0.69	9.25	2.26	9.94	8.00	12.20	.....	4.72	4.00	
20041	.....	.....	.....	.....	4.11	6.88	4.08	10.99	11.00	15.07	.....	2.15	2.00	
20042	2.38	1.00	3.38	3.29	4.87	3.25	1.86	8.12	6.00	9.98	.....	10.64	10.00	
20043	0.42	1.84	2.26	2.06	5.02	4.60	2.35	9.62	8.00	11.98	.....	2.26	1.50	
20044	0.85	1.23	2.08	2.06	5.92	2.31	2.76	8.23	8.00	10.99	.....	3.37	3.00	
20045	1.50	1.03	2.53	2.40	5.82	1.76	2.63	7.58	6.00	10.21	7.00	10.44	10.00	
20046	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.80	48.00	
20047	0.19	0.78	0.97	0.82	5.69	3.36	2.11	9.05	8.00	11.16	.....	4.57	4.00	
20048	0.95	1.02	1.97	1.64	4.47	3.20	2.74	7.67	8.00	10.41	.....	2.53	2.00	

\* Undetermined.



*Descriptive List of Manufacturers' Samples, 1905.*

Station number.	Manufacturer, place of business and brand.
20049	Lazaretto High Grade Potato Guano .....
20050	Lazaretto Propeller Potato Guano.....
20051	Lazaretto Wheat, Oats and Clover Fertilizer.....
20052	Muriate of Potash .....
20053	Nitrate of Soda. ....
20054	Otis' Potato Fertilizer.....
20055	Otis' Seeding Down Fertilizer.....
20056	Otis' Superphosphate .....
20057	Pacific Dissolved Bone and Potash.....
20058	Pacific Grass and Grain Fertilizer .....
20059	Pacific High Grade General Fertilizer.....
20060	Pacific Nobsque Guano .....
20061	Pacific Potato Special.....
20062	Packers Union Animal Corn Fertilizer.....
20063	Packers Union Economical Vegetable Guano .....
20064	Packers Union Gardeners Complete Manure .....
20065	Packers Union Potato Manure .....
20066	Packers Union Universal Fertilizer .....
20067	Packers Union Wheat, Oats and Clover Fertilizer .....
20068	Plain Superphosphate.....
20069	Quinnipiac Climax Phosphate for All Crops....
20070	Quinnipiac Corn Manure.....
20071	Quinnipiac Market Garden Manure.....
20072	Quinnipiac Mohawk Fertilizer.....
20073	Quinnipiac Potato Manure .....
20074	Quinnipiac Potato Phosphate .....
20075	Read's Farmer's Friend.....
20076	Read's High Grade Farmer's Friend.....
20077	Read's Potato Manure.....
20078	Read's Practical Potato Special.....
20079	Read's Standard Superphosphate.....
20080	Read's Sure Catch Fertilizer.....
20081	Read's Vegetable and Vine Fertilizer.....
20082	Soluble Pacific Guano.....
20083	Standard A Brand .....
20084	Standard Bone and Potash .....
20085	Standard Complete Manure .....
20086	Standard Fertilizer.....
20087	Standard Guano for All Crops. ....
20088	Standard Special for Potatoes.....
20089	Williams and Clark's Americus Ammoniated Bone Superphosphate.....
20090	Williams and Clark's Americus Corn Phosphate.....
20091	Williams and Clark's Americus High Grade Special.....
20092	Williams and Clark's Americus Potato Manure.....
20093	Williams and Clark's Royal Bone Phosphate for all Crops .....

*Analyses of Manufacturers' Samples, 1905.*

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
20049	% 1.21	% 1.82	% 3.03	% 3.29	% 4.00	% 1.90	% 2.27	% 5.90	% 6.00	% 8.17	% .....	% 10.60	% 10.00	
20050	0.70	1.30	2.00	2.06	5.69	2.56	2.88	8.25	8.00	11.13	.....	6.52	6.00	
20051	.....	.....	.....	.....	8.60	3.56	1.00	12.16	11.00	13.16	.....	2.78	2.00	
20052	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49.64	50.00	
20053	.....	.....	15.28	15.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	
20054	0.77	1.22	1.99	2.06	5.68	5.03	2.42	10.71	8.00	13.13	10.00	3.20	3.00	
20055	0.49	0.62	1.11	1.03	5.46	2.89	1.35	8.35	8.00	9.70	10.00	1.56	2.00	
20056	0.68	1.38	2.06	2.06	6.94	2.92	2.43	9.86	8.00	12.29	10.00	2.16	1.50	
20057	.....	.....	.....	.....	5.98	4.81	1.91	10.79	10.00	12.70	11.00	2.43	2.00	
20058	0.42	0.64	1.06	0.82	5.46	3.01	1.43	8.47	7.00	9.90	8.00	2.99	1.00	
20059	2.13	1.41	3.54	3.30	5.15	2.92	2.14	8.07	8.00	10.21	9.00	7.18	7.00	
20060	0.40	0.66	1.06	1.03	5.52	2.66	1.63	8.18	8.00	9.81	10.00	1.97	2.00	
20061	0.76	1.34	2.10	2.06	5.69	4.27	2.70	9.96	8.00	12.66	10.00	3.15	3.00	
20062	0.31	2.10	2.41	2.47	5.64	3.22	3.46	8.86	9.00	12.32	.....	1.91	2.00	
20063	0.26	1.47	1.68	1.25	4.65	2.55	2.15	7.20	6.00	9.35	.....	3.59	3.00	
20064	1.38	1.16	2.54	2.47	5.58	0.47	2.06	6.05	6.00	8.11	.....	10.99	10.00	
20065	0.96	1.10	2.06	2.06	4.85	3.16	1.85	8.01	8.00	9.86	.....	6.54	6.00	
20066	0.25	0.96	1.21	0.82	6.05	3.22	1.46	9.27	8.00	10.73	.....	5.04	4.00	
20067	.....	.....	.....	.....	.....	.....	1.20	10.92	11.00	12.12	.....	2.39	2.00	
20068	.....	.....	.....	.....	9.04	4.41	2.45	13.95	14.00	16.40	.....	.....	.....	
20069	0.39	1.06	1.45	1.03	5.10	3.54	1.63	8.64	8.00	10.27	10.00	2.91	2.00	
20070	0.67	1.38	2.05	2.06	6.69	2.63	2.41	9.32	8.00	11.73	10.00	1.95	1.50	
20071	2.19	1.39	3.58	3.30	4.23	4.67	1.47	8.90	8.00	10.37	9.00	7.57	7.00	
20072	0.03	0.83	0.86	0.82	2.60	4.87	3.86	7.47	7.00	11.33	8.00	1.58	1.00	
20073	1.03	1.50	2.53	2.50	2.55	4.03	3.06	6.58	6.00	9.64	8.00	5.15	5.00	
20074	0.74	1.30	2.04	2.06	5.61	4.71	2.36	10.32	8.00	12.68	10.00	3.34	3.00	
20075	0.81	1.05	1.86	2.06	6.41	2.92	2.49	9.33	8.00	11.82	10.00	3.33	3.00	
20076	1.60	1.58	3.18	3.30	3.89	2.20	2.17	6.09	6.00	8.26	7.00	10.02	10.00	
20077	0.42	2.28	2.70	2.40	4.59	1.89	1.25	6.48	6.00	7.73	7.00	10.94	10.00	
20078	0.42	0.74	1.16	0.82	1.64	2.56	1.99	4.20	4.00	6.19	5.00	8.03	8.00	
20079	0.10	0.94	1.04	0.82	5.87	2.89	2.23	8.76	8.00	10.99	10.00	4.81	4.00	
20080	.....	.....	.....	.....	4.46	5.17	1.58	9.81	10.00	11.39	11.00	1.91	2.00	
20081	0.32	1.80	2.12	2.06	5.94	2.25	1.38	8.29	8.00	9.67	10.00	6.35	6.00	
20082	0.52	1.46	1.98	2.06	6.72	2.72	2.32	9.44	8.00	11.76	10.00	1.91	1.50	
20083	0.31	0.90	1.21	0.82	3.64	4.10	2.08	7.74	7.00	9.82	8.00	1.56	1.00	
20084	.....	.....	.....	.....	7.66	2.60	1.96	10.26	10.00	12.22	11.00	2.08	2.00	
20085	2.40	0.90	3.30	3.30	7.02	1.99	1.04	8.81	8.00	9.85	9.00	7.56	7.00	
20086	0.60	1.42	2.02	2.06	6.82	2.43	2.55	9.25	8.00	11.80	10.00	2.01	1.50	
20087	0.37	0.70	1.07	1.03	5.31	3.03	1.44	8.34	8.00	9.74	10.00	2.10	2.00	
20088	0.82	1.20	2.02	2.06	5.65	5.16	2.40	10.81	8.00	13.21	10.00	2.93	3.00	
20089	0.95	1.32	2.27	2.50	6.72	3.08	1.94	9.80	9.00	11.74	11.00	2.35	2.00	
20090	0.56	1.42	1.98	2.06	6.75	2.85	2.29	9.60	8.00	11.89	10.00	1.95	1.50	
20091	2.15	1.39	3.54	3.30	3.80	4.10	2.15	7.90	8.00	10.05	9.00	7.48	7.00	
20092	0.64	1.32	1.96	2.06	5.52	4.89	2.23	10.41	8.00	12.64	10.00	3.03	3.00	
20093	0.29	0.82	1.11	1.03	5.47	3.14	2.55	8.61	8.00	11.16	10.00	2.59	2.00	



*Descriptive List of Manufacturers' Samples, 1905.*

Station number.	Manufacturer, place of business and brand.
<b>THE BOWKER FERTILIZER CO., BOSTON, MASS.</b>	
20094	Bowker's Bone, Blood and Potash.....
20095	Bowker's Bone and Potash Square Brand.....
20096	Bowker's Corn Phosphate.....
20097	Bowker's Early Potato Manure .....
20098	Bowker's Farm and Garden Phosphate .....
20099	Bowker's Fresh Ground Bone .....
20100	Bowker's Hill and Drill Phosphate .....
20101	Bowker's Market Garden Fertilizer.....
20102	Bowker's Potash Bone .....
20103	Bowker's Potash or Staple Phosphate.....
20104	Bowker's Potato and Vegetable Fertilizer.....
20105	Bowker's Potato and Vegetable Phosphate.....
20106	Bowker's Six Per Cent Potato Fertilizer.....
20107	Bowker's Superphosphate with Potash for Grass and Grain.....
20108	Bowker's Sure Crop Phosphate .....
20109	Bowker's Ten Per Cent Manure.....
20110	Monticello Grange Chemicals.....
20111	Stockbridge Special Manures (for Corn, etc., Class D 107) .....
20112	Stockbridge Special Manures (for Grass, etc., Class F 56) .....
20113	Stockbridge Special Manures (for Potatoes, etc., Class D 610).....
20114	Stockbridge Special Manures (for Seeding Down, etc., Class C 610).....
E. FRANK COE CO., NEW YORK CITY, N. Y.	
20115	E. Frank Coe's Celebrated Special Potato Fertilizer.....
20116	E. Frank Coe's Columbian Corn Fertilizer .....
20117	E. Frank Coe's Columbian Potato Fertilizer.....
20118	E. Frank Coe's Excelsior Potato Fertilizer.....
20119	E. Frank Coe's Grass and Grain Special.....
20120	E. Frank Coe's High Grade Ammoniated Bone Superphosphate .....
20121	E. Frank Coe's High Grade Potato Fertilizer.....
20122	E. Frank Coe's New Englander Corn Fertilizer.....
20123	E. Frank Coe's New Englander Special Potato Fertilizer .....
20124	E. Frank Coe's Prize Brand Grain and Grass Fertilizer .....
20125	E. Frank Coe's Red Brand Excelsior Guano .....
20126	E. Frank Coe's Standard Grade Ammoniated Bone Superphosphate.....
JOHN WATSON COMPANY, HOULTON, ME.	
20127	Watson's Improved High Grade Potato Manure .....
LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK, N. J.	
20133	Lister's Animal Bone and Potash .....
20134	Lister's High Grade Special for Spring Crops .....
20135	Lister's Oneida Special .....
20136	Lister's Potato Manure .....
20137	Lister's Special Corn Fertilizer .....
20138	Lister's Special Potato Fertilizer.....
20139	Lister's Success Fertilizer .....
NATIONAL FERTILIZER CO., BRIDGEPORT, CONN.	
20140	Chittenden's Complete Root.....
20141	Chittenden's Market Garden .....

*Analyses of Manufacturers' Samples, 1905.*

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
	%	%	%	%	%	%	%	%	%	%	%	%	%	
20094	2.21	1.75	3.36	4.10	3.27	4.83	2.11	8.10	8.00	10.21	10.00	6.77	7.00	
20095	1.03	0.81	1.84	1.65	1.04	3.68	7.10	4.72	6.00	11.82	7.00	2.34	2.00	
20096	0.40	1.14	1.54	1.65	2.27	5.90	2.19	8.17	8.00	10.36	9.00	2.52	2.00	
20097	1.19	1.95	3.14	3.29	3.57	3.49	2.23	7.06	7.00	9.29	8.00	7.33	7.00	
20098	0.52	1.16	1.68	1.65	2.20	6.62	2.50	8.92	8.00	11.42	9.00	2.80	2.00	
20099	.....	.....	2.50	2.42	.....	.....	.....	.....	.....	19.09	18.00	.....	.....	
20100	0.71	1.73	2.44	2.47	3.27	5.48	2.76	8.75	9.00	11.51	10.00	2.16	2.00	
20101	1.59	0.79	2.38	2.47	5.55	2.12	1.34	7.67	6.00	9.01	7.00	9.85	10.00	
20102	0.90	.....	0.90	0.82	3.05	1.93	3.03	4.98	6.00	8.01	7.00	2.10	2.00	
20103	0.18	0.74	0.92	0.82	1.69	6.43	2.15	8.12	8.00	10.27	9.00	3.37	3.00	
20104	0.61	1.73	2.34	2.47	7.26	2.32	0.83	9.58	8.00	10.41	10.00	4.30	4.00	
20105	0.30	1.18	1.48	1.65	2.28	6.79	2.31	9.07	9.00	11.38	10.00	2.32	2.00	
20106	0.35	0.65	1.00	0.82	1.39	4.82	3.05	6.21	6.00	9.26	7.00	6.48	6.00	
20107	.....	.....	.....	.....	4.39	5.30	1.71	9.69	10.00	11.40	11.00	2.84	2.00	
20108	0.35	0.72	1.07	0.82	4.93	3.50	2.42	8.43	9.00	10.85	10.00	2.37	2.00	
20109	0.17	0.69	0.86	0.82	1.29	3.92	1.99	5.21	5.00	7.20	6.00	10.34	10.00	
20110	1.15	1.09	2.24	2.50	5.34	2.80	1.67	8.14	8.00	9.81	12.00	4.17	4.00	
20111	1.93	1.40	3.33	3.29	7.89	2.30	.91	10.19	7.00	11.10	8.00	7.39	7.00	
20112	3.18	1.88	5.06	4.94	3.01	2.69	2.26	5.70	4.00	7.96	6.00	6.11	6.00	
20113	1.32	1.88	3.20	3.29	2.57	3.54	2.27	6.11	6.00	8.38	7.00	10.34	10.00	
20114	0.79	1.59	2.38	2.47	2.97	2.88	4.24	5.85	6.00	10.09	9.00	10.04	10.00	
20115	1.26	0.62	1.88	1.65	7.34	1.19	2.71	8.53	8.00	11.24	10.00	4.73	4.00	
20116	0.60	0.74	1.34	1.23	7.29	2.77	2.53	9.46	8.50	12.01	10.50	2.98	2.50	
20117	0.54	0.80	1.34	1.23	6.30	2.16	2.49	9.46	8.50	11.95	10.50	3.08	2.50	
20118	1.46	0.96	2.41	2.47	6.03	1.97	2.22	8.00	7.00	10.22	9.00	9.35	8.00	
20119	0.07	0.73	0.80	0.80	6.73	2.57	2.81	9.30	8.50	12.11	.....	2.28	1.50	
20120	1.02	1.06	2.08	1.85	6.76	2.26	2.30	9.02	9.00	11.32	11.00	3.09	2.25	
20121	1.68	0.92	2.60	2.40	7.15	1.53	2.76	8.68	8.00	11.44	10.00	6.48	6.00	
20122	0.63	0.70	1.33	0.80	7.15	2.42	2.60	9.57	7.50	12.17	9.00	3.11	3.00	
20123	0.37	0.66	1.03	0.80	6.09	2.36	2.78	8.45	7.50	11.23	9.00	3.28	3.00	
20124	.....	.....	.....	.....	6.64	3.96	3.06	10.55	10.50	13.61	12.00	2.59	2.00	
20125	2.30	1.07	3.37	3.30	7.59	2.14	1.77	9.73	9.00	11.50	10.00	6.74	6.00	
20126	0.63	0.56	1.19	1.20	6.03	2.50	2.70	8.53	8.50	11.23	10.00	3.90	2.00	
20127	2.20	1.06	3.26	3.00	4.59	1.96	1.39	6.55	6.00	7.94	.....	5.20	5.00	
20133	.....	.....	.....	.....	6.44	3.84	2.19	10.28	11.00	12.47	11.00	2.26	2.00	
20134	0.45	1.50	1.95	1.65	3.75	4.34	3.07	8.09	8.00	11.16	.....	11.16	10.00	
20135	0.34	0.83	1.17	0.83	4.42	3.71	2.48	8.13	7.00	10.61	8.00	1.16	1.00	
20136	1.92	1.25	3.17	3.30	5.50	2.46	3.09	7.96	8.00	11.05	9.00	7.22	7.00	
20137	0.70	1.12	1.82	1.65	5.63	3.72	2.39	9.35	8.00	11.74	9.00	3.66	3.00	
20138	0.64	1.22	1.86	1.65	5.66	3.94	2.19	9.60	8.00	11.79	9.00	3.52	3.00	
20139	0.31	0.99	1.30	1.24	6.16	3.02	2.58	9.18	9.00	11.76	11.00	2.37	2.00	
20140	1.71	1.73	3.44	3.30	6.51	1.49	1.78	8.00	8.00	9.78	10.00	6.01	6.00	
20141	1.16	1.26	2.42	2.40	3.70	2.49	2.17	6.19	6.00	8.36	8.00	5.63	5.00	

*Descriptive List of Manufacturers' Samples, 1905.*

Station number.	Manufacturer, place of business and brand.
	NEW ENGLAND FERTILIZER CO., BOSTON, MASS.
20142	New England Complete Manure .....
20143	New England Corn and Grain Fertilizer.....
20144	New England Corn Phosphate.....
20145	New England High Grade Potato Fertilizer....
20146	New England High Grade Special (with 10% potash) .....
20147	New England Potato Fertilizer.....
20148	New England Superphosphate .....
20149	THE PARMENTER & POLSEY FERTILIZER CO., PEABODY, MASS. A A Brand Fertilizer.....
20150	Aroostook Special Fertilizer .....
20151	Muriate of Potash .....
20152	Nitrate of Soda.....
20153	P. & P. Grain Grower .....
20154	P. & P. Potato Fertilizer.....
20155	Plymouth Rock Brand Fertilizer.....
20156	Pure Ground Bone.....
20157	Special Potato Fertilizer .....
20158	Star Brand Superphosphate .....
20159	PORTLAND RENDERING CO., PORTLAND, ME. Bone Dust Tankage .....
20160	PROVINCIAL CHEMICAL FERTILIZER CO., LIMITED, ST. JOHN, N. B. Special Potato Phosphate .....
20161	10% Complete Aroostook Potato .....
20162	RUSSIA CEMENT CO., GLOUCESTER, MASS. Essex A 1 Superphosphate.....
20163	Essex Complete Manure for Corn, Grain and Grass.....
20164	Essex Complete Manure for Potatoes, Roots and Vegetables.....
20165	Essex Corn Fertilizer .....
20166	Essex Market Garden and Potato Manure .....
20167	Essex XXX Fish and Potash.....
20168	SAGADAHOC FERTILIZER CO., BOWDOINHAM, ME. Acid Phosphate.....
20169	Aroostook Potato Manure .....
20171	Dirigo Fertilizer.....
20172	Muriate of Potash .....
20173	Nitrate of Soda.....
20174	Sagadahoc High Grade Superphosphate .....
20175	Sagadahoc Special Potato Fertilizer.....
20176	Special Clover Fertilizer.....
20177	XX Chemical Fertilizer.....
20178	Yankee Fertilizer.....
20179	THE SCIENTIFIC FERTILIZER CO., PITTSBURG, PA. Scientific "Bone, Meat and Potash" Fertilizer.....
20180	Scientific "Corn and Grain" Fertilizer .....
20181	Scientific "Economy" Fertilizer .....
20182	Scientific Potato Fertilizer .....
20183	Scientific Potato and Vegetable Fertilizer.....
20184	SWIFT'S LOWELL FERTILIZER CO., BOSTON, MASS. Swift's Lowell Acid Phosphate .....

*Analyses of Manufacturers' Samples, 1905.*

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
	%	%	%	%	%	%	%	%	%	%	%	%	%	
20142	2.40	0.90	3.30	3.28	6.76	1.79	1.24	8.55	8.00	9.79	9.00	7.56	7.00	
20143	0.44	0.76	1.20	1.22	5.66	1.40	0.55	7.06	7.00	7.61	8.00	2.05	2.00	
20144	0.76	1.02	1.78	1.64	3.85	4.93	1.33	8.78	8.00	10.11	9.00	3.23	3.00	
20145	1.28	1.20	2.48	2.46	5.65	2.38	2.16	8.03	8.00	10.19	9.00	6.18	6.00	
20146	2.32	1.40	3.72	3.69	5.38	3.53	1.17	8.91	7.00	9.08	8.00	10.54	10.00	
20147	0.88	0.88	1.76	1.64	3.46	4.89	0.98	8.35	7.00	9.33	8.00	4.28	4.00	
20148	1.24	1.24	2.48	2.46	7.58	1.63	1.05	9.21	9.00	10.26	10.00	4.54	4.00	
20149	2.93	0.92	3.85	4.10	2.81	4.75	0.64	7.56	7.00	8.20	8.00	8.79	8.00	
20150	2.49	1.16	3.65	3.70	4.33	3.21	0.66	7.54	7.00	8.20	8.00	10.33	10.00	
20151	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.28	50.00	
20152	15.42	.....	15.42	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	
20153	0.59	0.61	1.20	0.82	3.30	4.45	4.32	7.75	7.00	12.07	8.00	2.70	2.00	
20154	1.00	0.84	1.84	1.64	2.36	5.15	0.99	7.51	6.00	8.50	7.00	6.91	6.00	
20155	0.21	2.08	2.29	2.47	3.81	4.21	1.38	8.02	8.00	9.46	9.00	4.19	4.00	
20156	.....	.....	1.80	2.47	.....	.....	.....	.....	5.00	20.13	23.00	.....	.....	
20157	1.69	1.29	2.98	3.29	4.21	4.27	1.29	8.48	8.00	9.77	9.00	7.41	7.00	
20158	1.01	0.79	1.80	1.64	3.80	3.54	1.15	7.34	7.00	8.49	8.00	2.60	2.50	
20159	2.69	3.43	6.12	5.30	.....	.....	4.85	9.57	7.10	14.42	15.30	.....	.....	
20160	1.06	1.08	2.14	2.05	7.73	1.13	4.30	8.86	8.00	13.16	.....	6.15	6.00	
20161	3.39	0.76	4.15	3.29	6.83	1.11	0.87	8.00	8.00	8.87	.....	11.55	10.00	
20162	0.18	1.34	1.52	1.00	1.96	5.32	4.93	7.29	7.00	12.22	9.00	2.11	2.00	
20163	0.97	2.91	3.88	3.30	5.90	3.75	1.50	9.65	7.00	11.15	9.50	9.36	9.50	
20164	0.96	3.22	4.18	3.70	6.33	2.62	3.14	8.95	7.00	12.09	9.00	8.39	8.50	
20165	0.52	1.72	2.24	2.00	5.31	4.03	4.14	9.34	8.50	13.48	10.50	3.33	3.00	
20166	0.79	1.55	2.34	2.00	5.25	5.17	2.65	10.42	8.00	13.07	10.00	5.06	5.00	
20167	0.56	1.82	2.38	2.10	6.14	2.70	3.28	8.84	9.00	12.12	12.00	4.11	2.25	
20168	.....	.....	.....	.....	16.86	0.95	0.80	17.81	16.00	18.61	17.00	.....	.....	
20169	0.92	0.08	1.00	1.05	7.11	1.44	0.45	8.55	6.00	9.00	7.00	4.97	4.00	
20171	0.13	0.44	0.57	0.85	6.62	0.89	5.46	7.51	6.00	12.97	9.00	3.32	3.00	
20172	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	53.20	50.00	
20173	15.58	.....	15.58	14.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	
20174	1.54	0.38	1.92	1.85	6.86	1.14	3.50	8.00	7.00	11.50	8.00	4.37	3.00	
20175	1.33	0.58	1.91	2.00	4.63	1.66	4.54	6.29	7.00	10.83	8.00	9.83	8.00	
20176	0.45	0.75	1.20	0.85	3.94	6.20	2.76	10.14	5.00	12.90	8.00	.....	.....	
20177	7.03	1.07	8.10	7.00	.....	.....	3.76	4.29	3.00	8.05	7.00	10.05	8.00	
20178	0.35	0.41	0.76	0.40	7.30	2.73	1.04	10.03	7.00	11.07	8.00	3.05	2.00	
20179	0.70	2.32	3.02	3.33	4.43	1.55	3.14	5.98	8.00	9.12	10.00	8.55	8.00	
20180	0.52	1.32	1.87	1.66	5.55	1.71	1.51	7.26	8.00	8.77	9.00	2.47	2.00	
20181	0.52	1.24	1.76	1.66	6.16	1.71	1.64	7.87	9.00	8.51	10.00	4.16	4.00	
20182	0.71	1.92	2.63	2.50	4.26	1.20	2.70	5.46	8.00	8.16	10.00	6.23	6.00	
20183	0.68	2.62	3.30	3.33	4.12	1.99	3.70	6.11	7.00	8.87	8.00	10.62	10.00	
20184	.....	.....	.....	.....	10.43	2.38	1.58	12.81	12.00	14.39	.....	.....	.....	



*Descriptive List of Manufacturers' Samples, 1905.*

Station number.	Manufacturer, place of business and brand.										
20185	Swift's Lowell Animal Brand .....										
20186	Swift's Lowell Bone Fertilizer.....										
20187	Swift's Lowell Cereal Fertilizer.....										
20188	Swift's Lowell Dissolved Bone and Potash .....										
20189	Swift's Lowell Empress Brand.....										
20190	Swift's Lowell Ground Bone.....										
20191	Swift's Lowell Muriate of Potash.....										
20192	Swift's Lowell Nitrate of Soda .....										
20193	Swift's Lowell Potato Manure .....										
20194	Swift's Lowell Potato Phosphate .....										
20195	Swift's Superior Fertilizer with 10% Potash .....										

*Analyses of Manufacturers' Samples, 1905.*

Station number.	NITROGEN.				PHOSPHORIC ACID.								POTASH.	
	Soluble in water.	Insoluble in water.	Total.		Soluble.	Reverted.	Insoluble.	Available.		Total.		Found.	Guaranteed.	
			Found.	Guaranteed.				Found.	Guaranteed.	Found.	Guaranteed.			
20185	%	%	%	%	%	%	%	%	%	%	%	%	%	
20186	.86	1.46	2.32	2.46	7.85	1.34	0.94	9.19	9.00	10.13	10.00	4.55	4.00	
20186	0.73	0.94	1.67	1.64	5.26	2.76	1.79	8.02	8.00	9.81	9.00	3.20	3.00	
20187	0.34	0.50	0.84	0.82	5.22	1.76	1.32	6.98	7.00	8.30	8.00	1.18	1.00	
20188	0.54	1.08	1.62	1.64	7.11	1.65	1.02	8.76	9.00	9.78	10.00	2.14	2.00	
20189	0.35	0.77	1.12	1.23	6.03	1.12	0.66	7.15	7.00	7.81	8.00	2.11	2.00	
20190	.....	.....	2.87	2.46	.....	.....	.....	.....	.....	22.86	23.00	.....	.....	
20191	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	50.48	50.00	
20192	15.34	.....	15.34	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	
20193	0.56	0.96	1.52	1.64	4.55	2.34	1.40	6.89	7.00	8.29	8.00	4.24	4.00	
20194	1.31	1.16	2.47	2.46	5.66	2.49	1.71	8.15	8.00	9.86	9.00	6.35	6.00	
20195	2.52	1.28	3.80	3.69	5.60	1.98	1.30	7.58	7.00	8.88	8.00	10.23	10.00	



## THE CHIEF PROVISIONS OF THE FERTILIZER LAW APPLYING TO MANUFACTURERS, IMPORTERS AND DEALERS.

The law for the regulation of the sale and analyses of commercial fertilizers makes the following requirements upon manufacturers, importers or dealers who propose to sell or offer for sale commercial fertilizers in the State:

1. *The Brand.* Each package shall bear, conspicuously printed, the following statements:

The number of net pounds contained in each package.

The name or trade mark under which it is sold.

The name of the manufacturer or shipper.

The place of manufacture.

The place of business of manufacturer or shipper.

The percentage of nitrogen or its equivalent in ammonia.

The percentage of potash soluble in water.

The percentage of phosphoric acid in available form.

The percentage of total phosphoric acid.

2. *The Certificate.* There shall be filed annually between November 15 and December 15 with the Director of the Station a certificate containing an accurate statement of the brand. This certificate applies to the next succeeding calendar year. (Blanks for this purpose will be furnished on application to the Station.)

3. *Manufacturers' samples.* There shall be deposited annually, unless excused by the Director under certain conditions, a sample of fertilizer, with an accompanying affidavit that this sample "corresponds within reasonable limits to the fertilizer which it represents."

4. *Analysis fee.* For each brand of fertilizer sold or offered for sale in the State there shall be paid annually to the Treasurer of State "an analysis fee as follows: Ten dollars for the phosphoric acid and five dollars each for the nitrogen and potash, contained or said to be contained in the fertilizer."

5. *The license.* Upon receipt of the fee, the certificate and the sample (if required), the Director of the Station "shall issue a certificate of compliance."

[The full text of the law will be sent to those asking for it.]

CHAS. D. WOODS, *Director.*





